WHAT IS CLAIMED IS:

1. A system for processing a stereo input signal which includes center information, matrix encoded surround information, and stereo information, the system comprising:

first circuit for providing a center output which includes center monaural information;

second circuit for providing a surround output from the matrix encoded surround information which includes surround monaural information; and

third circuit for providing an expanded stereo output;

wherein the first circuit, the second circuit, and the third circuit process the stereo input signal to produce first and second output signals.

2. The system of claim 1, wherein:

the first and second output signals are respectively delivered to first and second speakers.

3. The system of claim 1, wherein:

the center output is used to form a phantom center sound image;

the surround output is used to form two virtual surround images; and

the expanded stereo output is used to form expanded stereo sound images.

4. The system of claim 3, wherein:

the phantom center sound image appears to a listener of the system to be located between a pair of speakers;

each virtual surround image appears to the listener to be located at a position which forms an obtuse angle with said pair of speakers; and

each stereo sound image appears to be located outside the physical limits of each speaker.

5. The system of claim 1, wherein the first circuit comprises:

a first summer which combines one channel of the stereo input signal with the other channel of the stereo input signal to form a center combined signal which has the surround information removed.

6. The system of claim 5, further comprising:

a multiplier which modifies the center combined signal.

7. The system of claim 5, further comprising:

a second summer which combines the center combined signal with one channel of the stereo input signal to form the first output signal; and

a third summer which combines the center combined signal with the other channel of the stereo input signal to form the second output signal.

8. The system of claim 1, wherein the second circuit comprises:

a fourth summer which combines one channel of the stereo input signal with an inverse of the other channel of the stereo input signal to form a surround combined signal which has the center information removed.

9. The system of claim 8, further comprising:

a delay device which modifies the surround combined signal to form a delayed signal; and

an attenuator which modifies the surround combined signal to form an attenuated signal.

10. The system of claim 9, further comprising:

circuit for adjusting an amplitude and phase of the delayed signal on a frequency dependent basis to form a first filtered signal; and

circuit for adjusting an amplitude and phase of the attenuated signal on a frequency dependent basis to form a second filtered signal.

11. The system of claim 10, further comprising:

a fifth summer which combines an inverse of said first filtered signal with said attenuated signal to form a combined delay filter attenuated signal; and

a sixth summer which combines an inverse of said second filtered signal with said delayed signal to form a combined attenuator filter delayed signal.

12. The system of claim 11, further comprising:

a seventh summer which combines said combined attenuator filter delayed signal with the one channel of the stereo input signal to form the first output signal; and

an eighth summer which combines said combined delay filter attenuated signal with the other channel of the stereo input signal to form the second output signal.

13. The system of claim 1, wherein the third circuit comprises:

circuit for combining one channel of the stereo signal with an inverse of the other channel of the stereo signal to form a difference signal; and

circuit for adjusting an amplitude and phase of the difference signal on a frequency dependent basis to form a third filtered signal.

14. The system of claim 13, further comprising:

a ninth summer which combines said third filtered signal with the one channel of the stereo input signal to form the first output signal; and

a tenth summer which combines an inverse of said third filtered signal with the other channel of the stereo input signal to form the second output signal.

15. The system of claim 10, wherein said circuit for adjusting to form said first filtered signal comprises:

a Q-filter.

16. The system of claim 10, wherein said circuit for adjusting to form said second filtered signal comprises:

a Q-filter.

17. The system of claim 13, wherein the circuit for adjusting to form said third filtered signal comprises:

a Q-filter.

18. The system of claim 8, further comprising:

an eleventh summer which combines an inverse of the surround combined signal with the one channel of the stereo input signal to form the first output signal; and

a twelfth summer which combines the surround combined signal with the other channel of the stereo input signal to form the second output signal.

19. The system of claim 13, further comprising:

circuit for controllably attenuating the difference signal prior to receipt by the circuit for adjusting.

20. A method for processing a stereo input signal which includes center information, matrix encoded surround information, and stereo information, the method comprising the steps of:

(a) providing a center output which includes center monaural information;

(b) providing a surround output from the matrix encoded surround information which includes surround monaural information; and

(c) providing an expanded stereo output;

wherein the steps (a), (b), and (c) process the stereo input signal to produce first and second output signals.

21. The method of claim 20, further comprising the step of:

delivering, respectively, the first and second output signals to first and second speakers.

22. The method of claim 20, further comprising the steps of:

forming, via the center output, a phantom center sound image;

forming, via the surround output, two virtual surround images; and

forming, via the expanded stereo output, expanded stereo sound images.

23. The method of claim 22, wherein:

the phantom center sound image appears to a listener of the system to be located between a pair of speakers;

each virtual surround image appears to the listener to be located at a position which forms an obtuse angle with said pair of speakers; and

each stereo sound image appears to be located outside the physical limits of each speaker.

24. The method of claim 20, wherein the step (a) comprises the step of:

combining one channel of the stereo input signal with the other channel of the stereo input signal to form a center combined signal which has the surround information removed.

25. The method of claim 24, wherein step (a) further comprises the step of:

controllably multiplying the center combined signal.

26. The method of claim 24, wherein step (a) further comprises the step of:

combining the center combined signal with one channel of the stereo input signal to form the first output signal; and

combining the center combined signal with the other channel of the stereo input signal to form the second output signal.

27. The method of claim 20, wherein the step (b) comprises the step of:

combining one channel of the stereo input signal with an inverse of the other channel of the stereo input signal to form a surround combined signal which has the center information removed.

28. The method of claim 20, wherein the step (b) further comprises the step of:

controllably delaying the surround combined signal to form a delayed signal; and

controllably attenuating the surround combined signal to form an attenuated signal.

29. The method of claim 28, wherein the step (b) further comprises the step of:

adjusting an amplitude and phase of the delayed signal on a frequency dependent basis to form a first filtered signal; and

adjusting an amplitude and phase of the attenuated signal on a frequency dependent basis to form a second filtered signal.

30. The method of claim 29, wherein the step (b) further comprises the steps of:

combining an inverse of said filtered signal with said attenuated signal to form a combined delay filtered attenuated signal; and

combining an inverse of said second filtered signal with said delayed signal to form a combined attenuator filter delayed signal.

31. The method of claim 30, wherein the step (b) further comprises the steps of:

combining said combined attenuator filter delayed signal with the one channel of the stereo input signal to form the first output signal; and

combining said combined delay filter attenuated signal with the other channel of the stereo input signal to form the second output signal.

32. The method of claim 20, wherein the step (c) comprises the steps of:

combining one channel of the stereo signal with an inverse of the other channel of the stereo signal to form a difference signal; and

adjusting an amplitude and phase of the difference signal on a frequency dependent basis to form a third filtered signal.

33. The method of claim 32, wherein the step (c) further comprises the steps of:

combining said third filtered signal with the one channel of the stereo input signal to form the first output signal; and

combining an inverse of said third filtered signal with the other channel of the stereo input signal to form the second output signal.

34. The method of claim 29, wherein:

the step of adjusting to form said first filtered signal is performed by a Q-filter.

35. The method of claim 29, wherein:

the step of adjusting to form said second filtered signal is performed by a Q-filter.

36. The method of claim 32, wherein:

the step of adjusting to form said third filtered signal is performed by a Q-filter.

37. The method of claim 27, wherein the step (b) further comprises the steps of:

combining an inverse of the surround combined signal with the one channel of the stereo input signal to form the first output signal; and

combining the surround combined signal with the other channel of the stereo input signal to form the second output signal.

38. The method of claim 32, wherein the step (c) further comprises the steps of:

controllably attenuating the difference signal prior to receipt by the circuit for adjusting.

39. A system for processing a stereo input signal which includes center information, matrix encoded surround information, and stereo information, the system comprising:

first circuit for providing a center output having center monaural information, which includes a first summer which combines one channel of the stereo input signal with the other channel of the stereo input signal to form a center combined signal which has the surround information removed;

second circuit for providing a surround output from the matrix encoded surround information having surround monaural information, which includes a second summer which combines one channel of the stereo input signal with an inverse of the other channel of the stereo input signal to form a surround combined signal which has the center information removed; and

third circuit for providing an expanded stereo output, which includes a first Q-filter which adjusts an amplitude and phase of the surround combined signal on a frequency dependent basis to form a first filtered signal;

wherein the center combined signal, the surround combined signal, and the filtered signal are used to produce first and second output signals.

40. The system of claim 39, further comprising:

a third summer which combines the center combined signal with one channel of the stereo input signal to form a first signal;

a fourth summer which combines the center combined signal with the other channel of the stereo input signal to form a second signal;

a fifth summer which combines an inverse of the surround combined signal with the first signal to form the third signal;

a sixth summer which combines the surround combined signal with the second signal to form a fourth signal;

a seventh summer which combines the first filtered signal with the third signal to form the first output signal; and

an eighth summer which combines an inverse of the first filtered signal with the fourth signal to form the second output signal.

41. The system of claim 40, further comprising:

a first attenuator which modifies the center combined signal prior to delivery to the third and fourth summers;

a second attenuator which modifies the surround combined signal prior to delivery to the fifth summer;

a third attenuator which modifies the surround combined signal prior to delivery to the sixth summer; and

a fourth attenuator which modifies the surround combined signal prior to delivery to the Q-filter.

42. The system of claim 39, further comprising:

a first attenuator which modifies the center combined signal to produce a first attenuated signal;

a second attenuator which modifies the surround combined signal to produce a second attenuated signal; and

a delay device which modifies the surround combined signal to produce a delayed signal.

43. The system of claim 42, further comprising:

a second Q-filter which adjusts an amplitude and phase of the delayed signal on a frequency dependent basis to form a second filtered signal; and

a third Q-filter which adjusts an amplitude and phase of the second attenuated signal on a frequency dependent basis to form a third filtered signal.

44. The system of claim 43, further comprising:

a third summer which combines an inverse of the third filtered signal with the delayed signal to form a first signal; and

a fourth summer which combines an inverse of the second filtered signal with the second attenuated signal to form a second signal.

45. The system of claim 44, further comprising:

a fifth summer which combines said first filtered signal with one channel of the stereo input signal to form a third signal;

a sixth summer which combines an inverse of said first filtered signal with the other channel of the stereo input signal to form a fourth signal;

a seventh summer which combines said first signal with said third signal to form a fifth signal;

an eighth summer which combines said second signal with said fourth signal to form a sixth signal;

a ninth summer which combines said fifth signal with said first attenuated signal to form the first output signal; and

a tenth summer which combines said sixth signal with said first attenuated signal to form the second output signal.